

## **A new dicyemid mesozoan, *Dodecadicyema loligoi* n. gen., n.sp. from the renal appendages of *Loligo* sp.**

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**Abstract.** The morphology of the different stages in the life-history of a new dicyemid mesozoan, *Dodecadicyema loligoi* n.gen., n.sp. from the renal appendages of *Loligo* sp. is described.

**Keywords.** *Dodecadicyema loligoi* n.gen. n.sp.; *Loligo* sp; dicyemid mesozoan; renal appendage.

### **1. Introduction**

32 specimens of *Loligo* were examined during 1976 for Dicyemid mesozoan parasites and 2 of them were infected with a new species of these parasites. A perusal of the literature showed that so far there has been no report of any dicyemid mesozoan from *Loligo*. The present form is described as a new genus and new species because it does not resemble any other form described so far.

### **2. Materials and methods**

*Loligo* were obtained from the catches of the offshore fishing station at Visakhapatnam. They were examined immediately after they were brought to the laboratory and smears were prepared from the fluid contained in the renal appendages. Some were airdried, fixed in methyl alcohol and stained with Giemsa while others were wet-fixed in Schaudinn's fluid and stained with iron haematoxylin. The description of the parasite was based on the material obtained from 2 hosts each measuring about 7.5 cm in length. The description of the different stages of the parasite was based on 50 forms of each stage selected at random from different smears, except infusorigens which were very few in the preparations, hence their description was mainly based on the infusoriform larvae found inside the rhombogens.

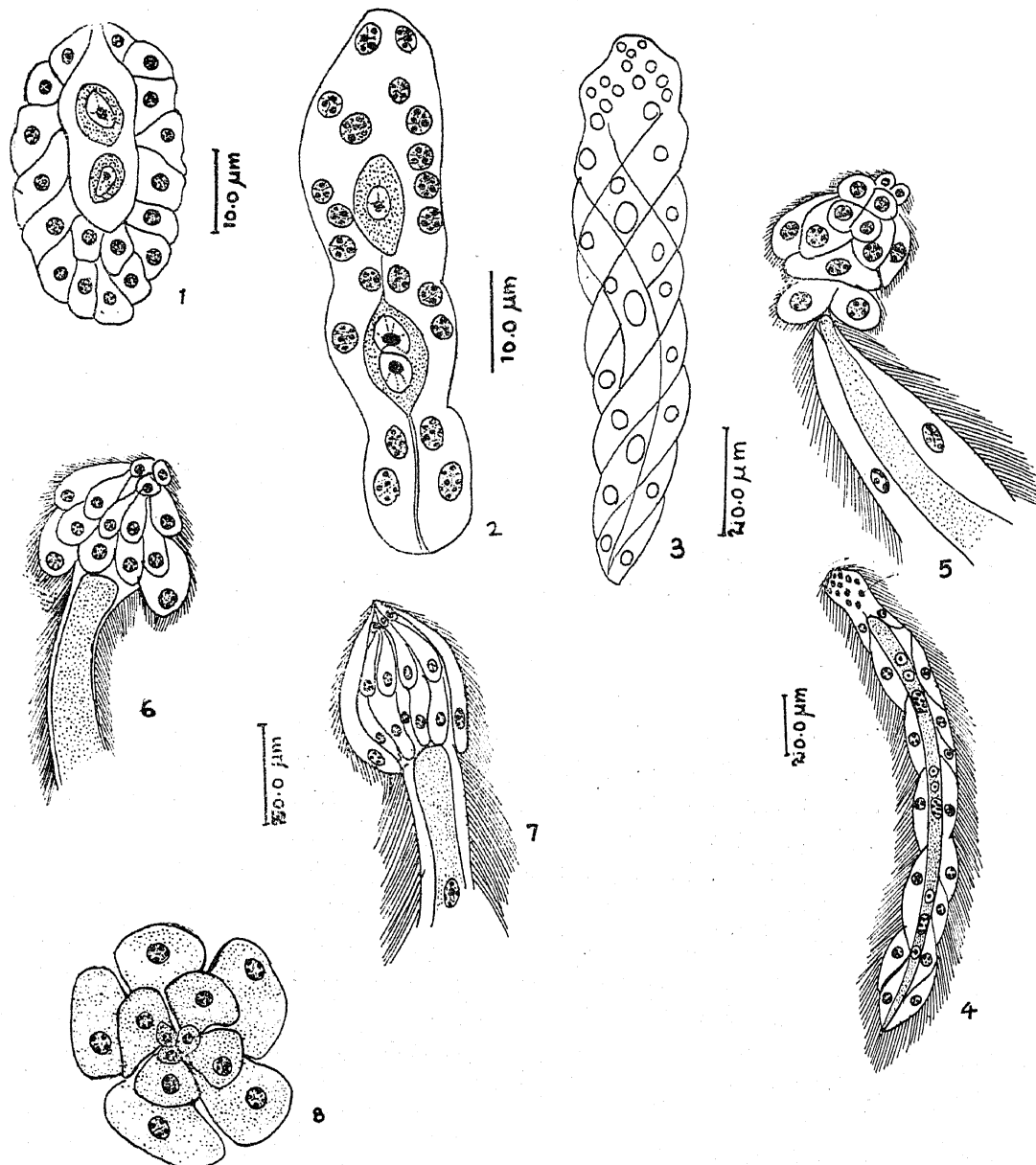
### **3. Observations**

The peripheral cell number of the vermiform stages varied from 29-32 (usually 30, with 12 calotte cells). Calotte composed of 2 or 3 very small cells in the first

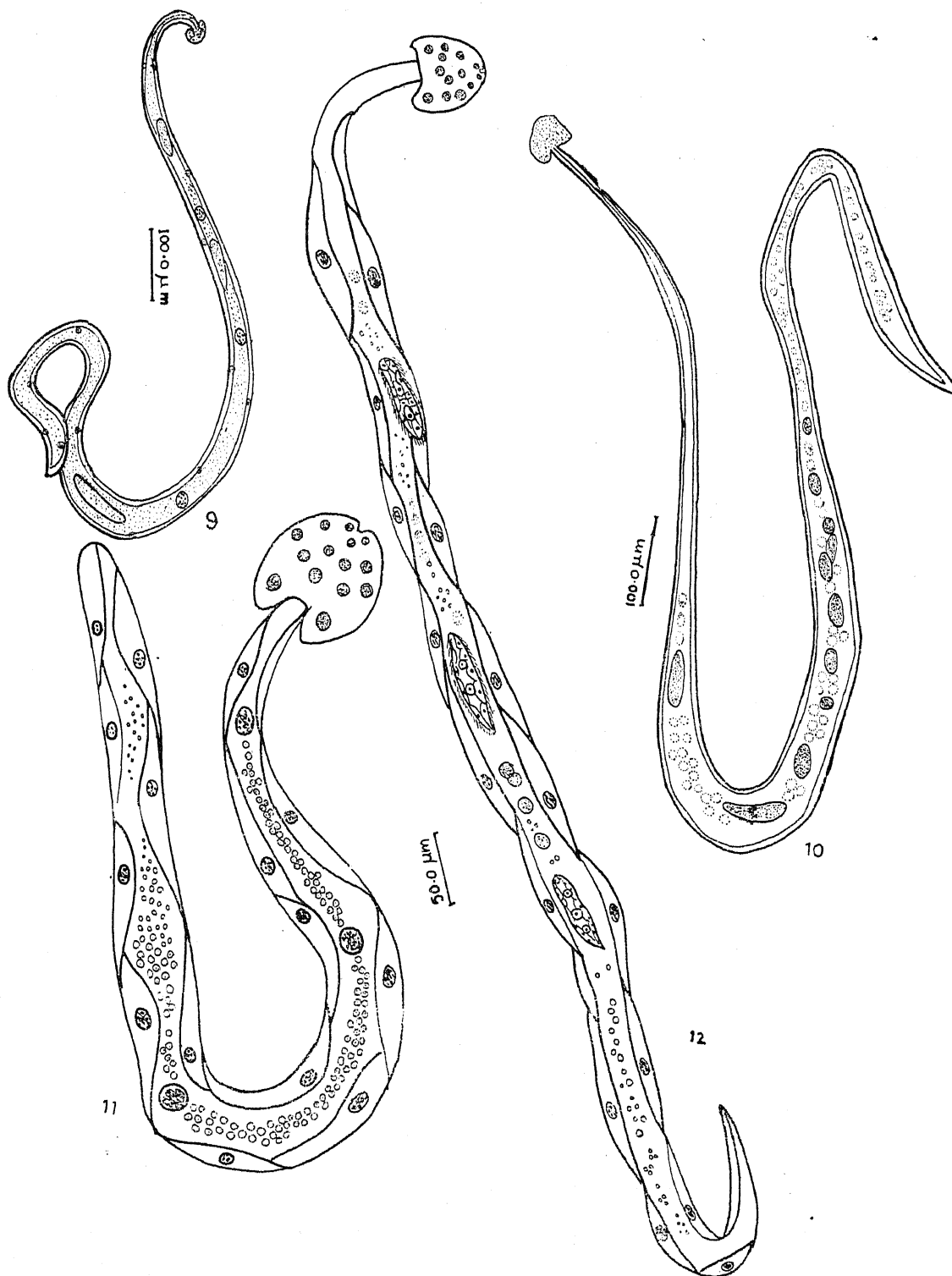
tier, 4 propolars in the second and 5 metapolars in the third tier. Somatic cells composed of 2 parapolars, 14-16 diapolars and 2 uropolars. Of the 50 nematogens examined 32 showed 12 calotte cells with 3 cells in the first tier 4 propolars and 5 metapolars (figure 8). 4 specimens showed only 2 cells in the first tier, 4 propolars and 5 metapolars and the remaining 14 specimens showed only 4 propolars and 5 metapolars.

### 3.1. Nematogen

Body thin and elongate having uniform ciliation (figures 9 and 10) and has a conspicuous cephalic swelling formed by the calotte. The 2 propolars form a delicate



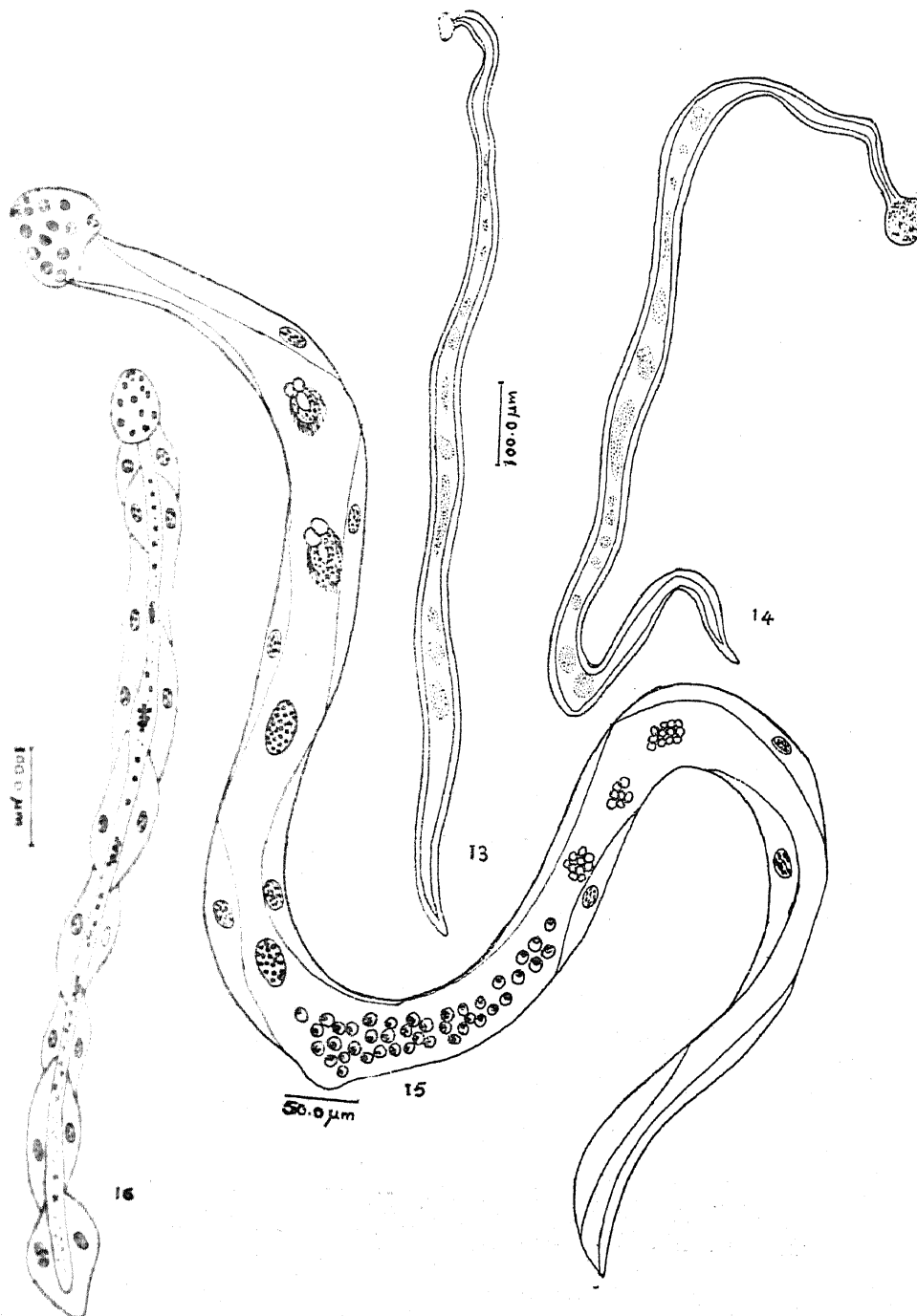
Figures 1-8. 1, 2. Developing vermiform embryos (inside nematogen). 3, 4. Vermiform embryos. 5. Calotte with 11 cells. 6. Calotte with 12 cells. 7. Calotte showing the 2 long parapolars. 8. Calotte (polar view).



Figures 9-12. 9, 10. Nematogens. 11. Nematogen showing agametoblasts in the axial cell. 12. Nematogen with vermiform embryos.

extension along the sides. The body sharply narrows below the calotte to form a neck which was formed by the parapolaris. The diapolaris widen posteriorly and narrow to a sharp point at the end of the uropolaris. Calotte rounded with lateral

expansions consisting of 3 tiers of cells, the first tier consisting of 2 or 3 very small cells, followed by 4 propolars in the second tier and 5 metapolars in the third tier (figures 5 and 6). They are orthotropical. In the side view the 2 parapolars appear as elongated cells extending from the tip of the calotte to the neck region (figure 7). Axial cells are 3 in number and they extend upto the base of the parapolars. In the older nematogens the nuclei were divided and a number of agametoblasts were seen in the axial cells (figures 9, 10 and 11). The nematogens varied in size from



Figures 13-16. 13, 14. Rhombogens. 15. Rhombogen showing developing infusorigens and gametoblasts. 16. Rhombogen with fully formed infusorigens inside an axial cell.

1480–680  $\times$  130–60  $\mu\text{m}$  and usually contained 2 or 3 vermiform embryos in each nematogen (figures 10 and 12).

### 3.2. Vermiform embryos

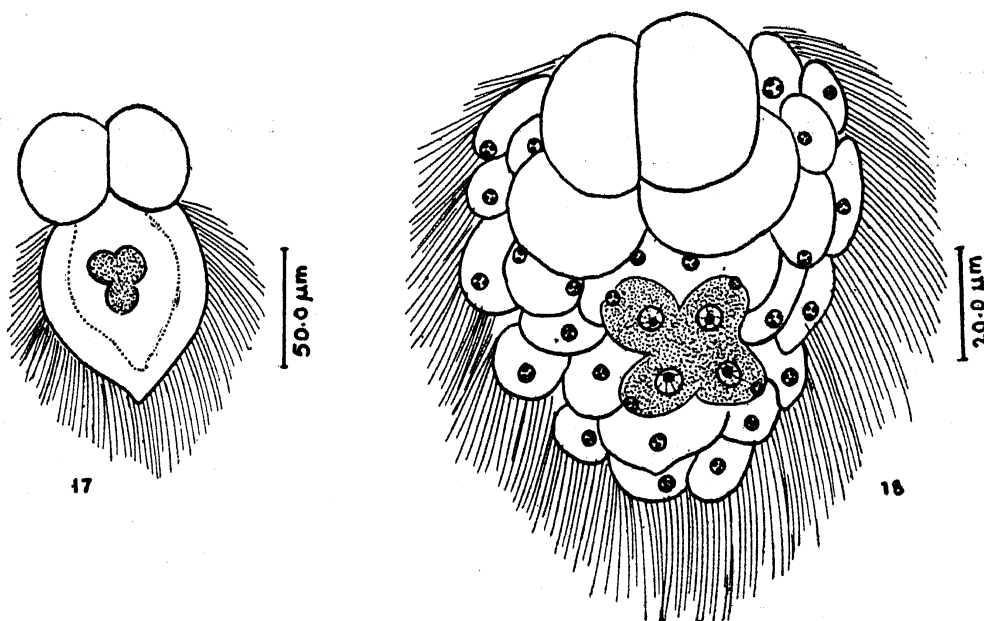
They are thin and elongate. Fully grown forms reach a size of 80  $\times$  20  $\mu\text{m}$  while within the nematogen. Trunk cells opposed. They are in pairs and were in whorls of three (figure 3). Axial cell nuclei 3, each axial cell with 2 or occasionally 4 axoblasts. Calotte same as in nematogen (figure 4).

### 3.3. Rhombogens

Similar to nematogens but were short and thicker. Cilia longer and closely placed. Body length varied from 1040–860  $\times$  80–120  $\mu\text{m}$  (figures 13 and 14). No acicular inclusions in the diapolars. Cytoplasm uniformly stained and finely granulated. There were no verruciform cells. Tail generally pointed. Uropolars laterally expanded. Axial cells showed a number of dividing gametoblasts and developing infusoriform larvae (figure 16). Fully formed larvae were seen more at the anterior end (figure 15).

### 3.4. Infusoriform larvae

Body pear-shaped with a broad anterior end and bluntly pointed posterior end, varying in size from 80–120  $\times$  70–100  $\mu\text{m}$  and uniformly covered with cilia. Refrangent bodies globular and paired measuring 24  $\mu\text{m}$  in diameter (figure 17). Infusoriform larvae composed of 32 cells of which 28 were somatic and 4 were germinal. Each of the urn cells contained one free nucleus and one germinal nucleus (figure 18).



Figures 17 and 18. Infusoriform larvae.

#### 4. Discussion

The two genera in the dicyemid mesozoans, *Dicyema* and *Dicyemenea* are characterised by the presence of 8 and 9 cells respectively in the calotte arranged in two tiers as propolars and metapolars. In the present form, the majority of specimens (32/50) showed 12 cells in the calotte arranged in 3 tiers, the first tier consisting of 2 or 3 very small cells lying in front of the propolars followed by 4 propolars in the second tier and 5 metapolars in the third tier. The presence of 3 small cells in front of the propolars has not been observed in any of the dicyemid mesozoans described so far. The present form has 29–32 somatic cells and in this respect comes close to *Dicyemenea antarctensis* reported from the octopod, *Parledon turqueti* which has a peripheral cell number ranging from 34–36, less often 31, 32 and 37 but varies considerably in the length width proportions and in the absence of an anterior abortive cell (Short and Hochberg 1970).

The infusoriform larvae in the present form are the largest so far recorded ranging in size from 80–120 × 70–100 µm and contain 32 cells. In *D. antarctensis* the infusoriform larvae measured 51 µm in length and was composed of 39 cells. The present form does not resemble any of the dicyemid mesozoans described so far, particularly in the presence of a unique calotte which is composed of 12 cells arranged in 3 tiers. Further, the present form is considered new because it is the first report of a dicyemid mesozoan from *Loligo* and from the present geographical locality. In view of these reasons, the form is considered new to science and the name *Dodecadicyema loligoi* n. gen. n. sp. is proposed for the same.

#### Acknowledgements

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#### Reference

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